

DRAFT Report destined for Bedfordshire Naturalist 71
Butterflies 2016

Keith Balmer and Peter Glenister

Many people said that 2016 had been a poor year for butterflies, but in reality, like most years, it was a curate's egg, good in parts.

Just one Brimstone, one Peacock, one Small Tortoiseshell and three Red Admirals had been reported prior to 11th March, but then a spell of warm sunny days kicked-off the butterfly year with near daily reports thereafter until mid-November. The first Comma to be noticed was on 20th March.

Between 29th March and 5th April there was a burst of first-flights for Small White, Green-veined White, Orange Tip, Speckled Wood, Large White and Holly Blue. The only other emergence in the rest of April was Small Copper on the 23rd.

The cold week 17 (23rd - 29th April) was rather dire and during it only 65 butterflies were reported. This is the time when the spring specialists of Dingy Skipper, Grizzled Skipper, Green Hairstreak and Duke of Burgundy would normally start to emerge but their first flights were all pushed back into the first week of May, which they then shared with Small Heath and Common Blue. Brown Argus and Small Blue emerged the week after. The attractiveness of the weather to flying butterflies declined throughout May but the first Painted Lady nonetheless arrived on the 24th.

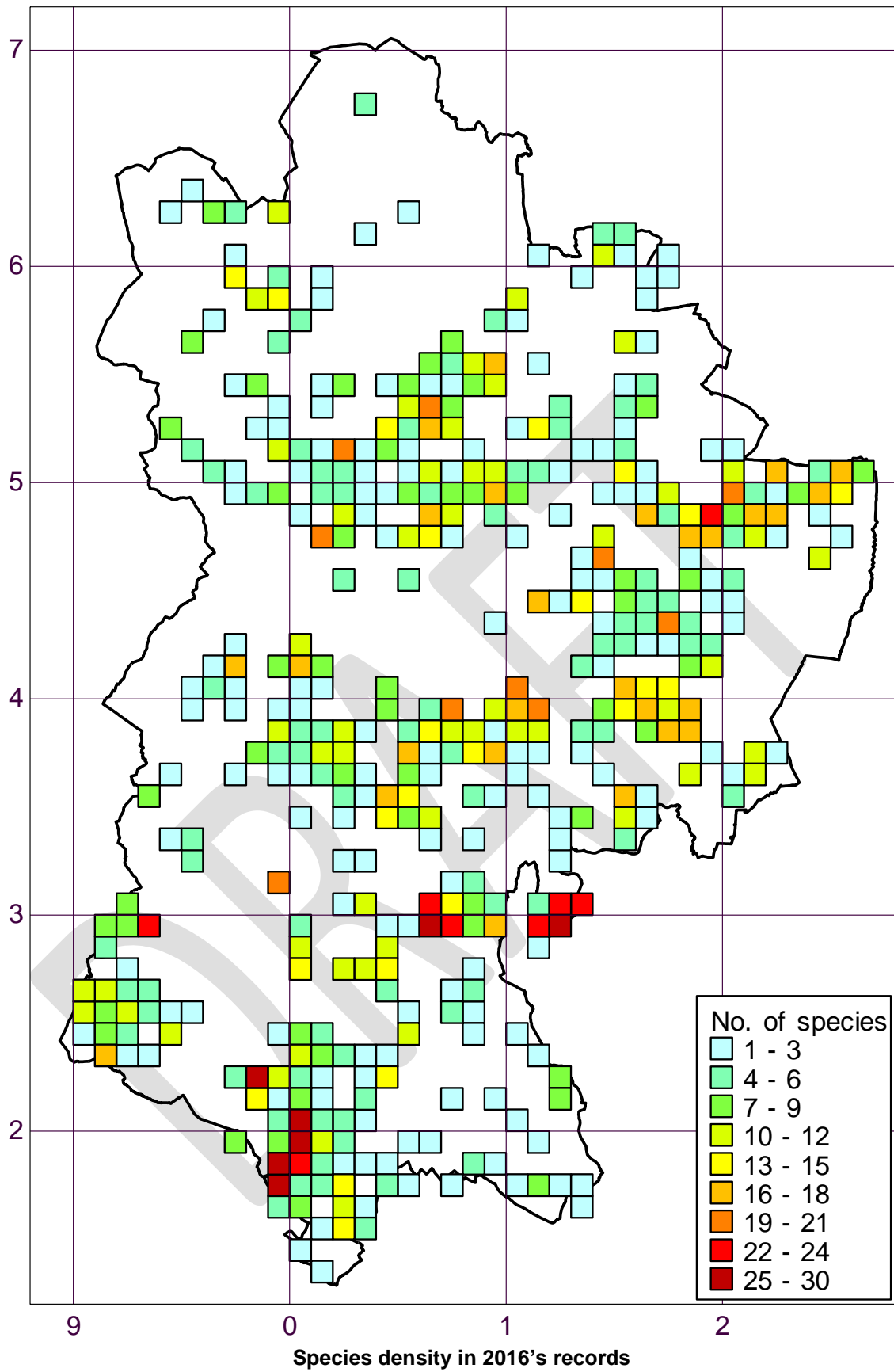
Throughout June there were many days of heavy rains and these probably had an effect of the immature stages of the summer-flying species as their abundances were generally down, with Peacock as a notable example. Species continued to emerge between the June showers however with Large Skipper on the 6th and Meadow Brown on the 9th. On the 19th three species started to fly, Small Skipper, Marbled White and Ringlet, followed three days later by Dark Green Fritillary which completed the June emergences.

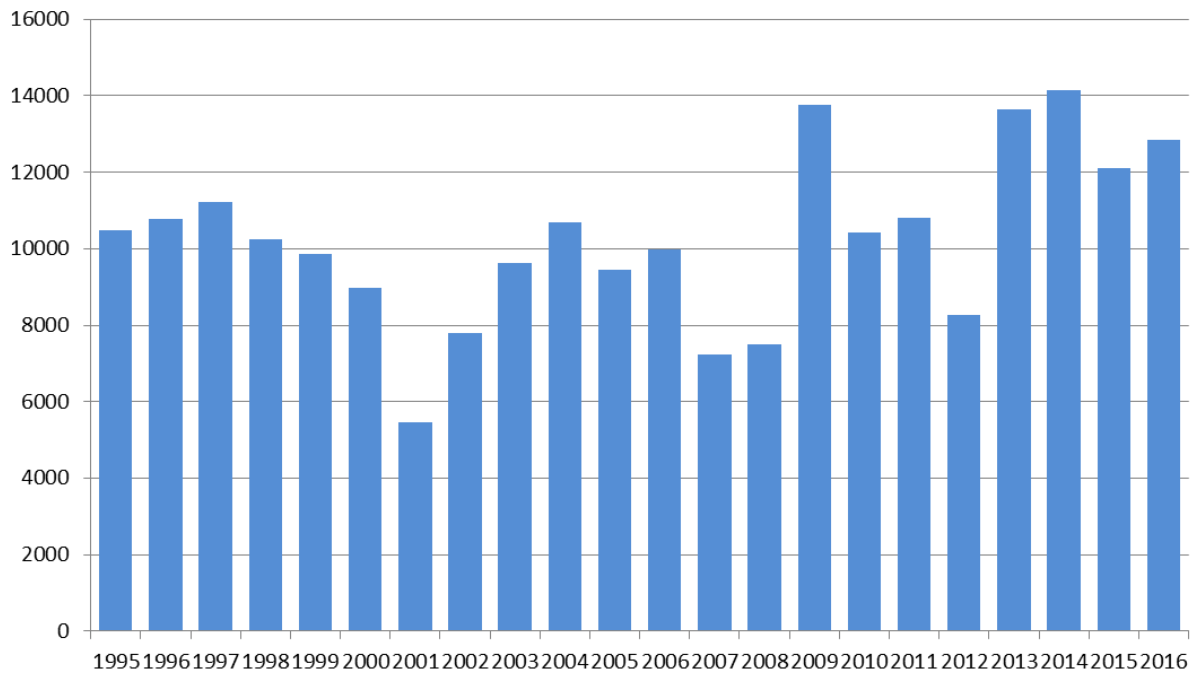
Silver-washed Fritillary and Gatekeeper both started flying on 2nd July and the first positively identified Essex Skipper was added on the 4th, closely followed by Chalkhill Blue, White Admiral, Purple Hairstreak and Purple Emperor, with White-letter Hairstreak bring up the rear on the 13th, completing the season's emergences. The first of the few migrant Clouded Yellows that did arrive was seen during this spell, on 7th July.

2016 is a difficult year to summarise because there isn't a clear overall message to convey. Some species like Brimstone, Dingy Skipper, Holly Blue, Red Admiral and Small Tortoiseshell were successful, and others such as Grizzled Skipper, White Admiral, Peacock and Dark Green Fritillary weren't. The others fell in between to varying degrees and so it is necessary to turn to the individual species reports that follow for further details.

Analysis of Data

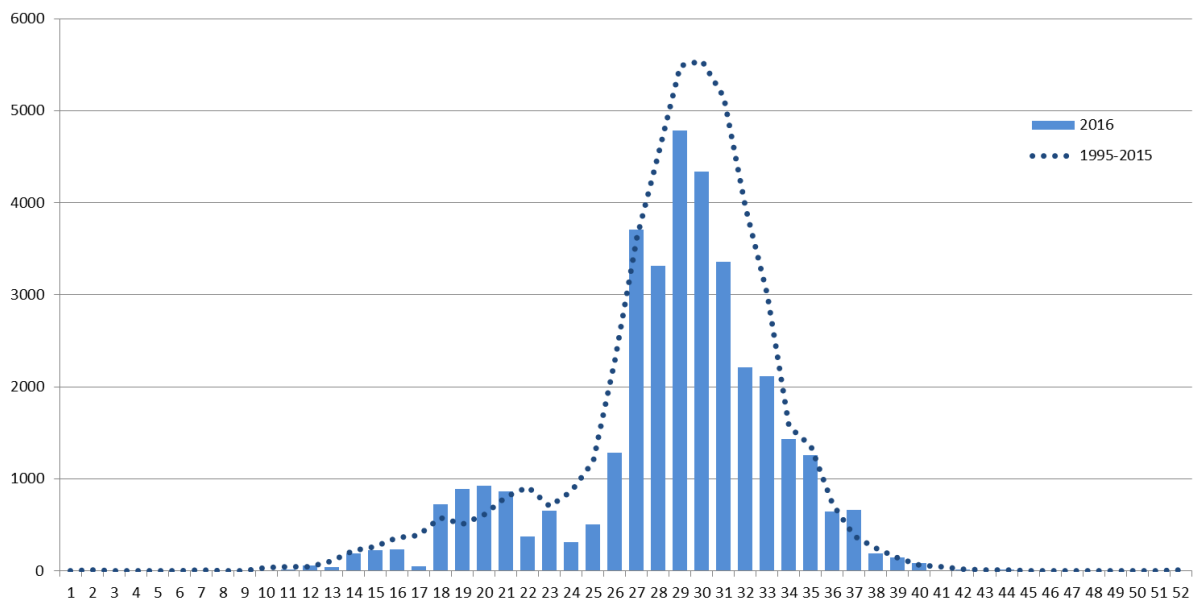
At the time of analysing records for this report (10th February 2017) 12,832 records had been received and computerised, containing reports of 46,116 adults from 435 1km squares. Records were analysed at this date and may be subject to minor revision.





Records per year 1995 to 2016

The chart of weekly adult abundance normalised to 10,000 records per year shows how 2016 compared with 1995-2015. Summer abundances were generally lower than average but the spring species generally fared better.



2016 versus 1995-2015: Adults per week per 10,000 records per year

Transects

The total number of adults and numbers of species () for the eleven recent transects were:

	2012	2013	2014	2015	2016	
Dunstable Downs	2336 (27)	4770 (29)	4090 (30)	3217 (32)	2789 (31)	Wilf Powell
Knocking Hoe	*	2836 (26)	2505 (23)	2161 (22)	2107 (24)	Graham Bellamy
Mowsbury Hill	*	*	1174 (19)	361 (18)	504 (19)	Chris Wedge
Old Warden Tunnel	218 (18)	474 (23)	687 (20)	418 (22)	323 (18)	Keith Balmer
Pegsdon Hills	*	*	1358 (26)	1270 (24)	1314 (25)	Ken Winder
Potton Wood	1087 (17)	2712 (22)	2691 (20)	1841 (20)	1897 (16)	Ian Woiwod,
Priory Country Park	629 (16)	1218 (18)	936 (18)	355 (19)	*	
Sharpenhoe Clappers	5446 (29)	10571 (29)	6138 (30)	6704 (27)	5951 (27)	David Chandler
Totternhoe Quarry	1662 (23)	3707 (26)	2634 (27)	1452 (28)	1797 (26)	Greg Herbert
Whipsnade Downs	2035 (27)	4427 (29)	3767 (30)	3037 (28)	1422 (27)	Greg Herbert
Whipsnade Zoo	*	3159 (27)	5020 (27)	4623 (27)	4272 (26)	Shea Marshall

*Whipsnade Zoo and Knocking Hoe were first walked in 2013. Pegsdon Hills (a new route) and Mowsbury Hill were first walked in 2014. Priory Country Park was not walked in 2016.

Our thanks again go to those that consistently walk and record these transects for 26 weeks each year, allowing scientific year-on-year comparisons to be made. These data are also combined at the national level with data from other transects as part of the Butterfly Monitoring Scheme.

Acquisition and processing of records

With the invention of many disparate means of submitting records the burden of acquiring and reformatting records into a single database is becoming more significant with each passing season. This year's data were acquired from Adnoto; iRecord general data; iRecord App; iRecord Butterflies; UK Butterfly Monitoring Scheme (via UKBMS website and via Transect Walker); Wider Countryside Butterfly Survey; Garden Butterfly Survey; BNHS Newsgroup; Facebook (multiple groups); spreadsheets (several formats); freeform emails and paper submissions. The relatively high volume of collated records is therefore becoming difficult to sustain and it may become necessary to limit the acceptable formats for submission in future.

Species Reports

In the following species reports "5ya" is an abbreviation for "5-year average. All analyses look back to 1995 unless stated otherwise.

Skippers

Small Skipper *Thymelicus sylvestris*

It was a rather poor season for this species. As a percentage of all records, at 1.48%, it was the second worst year, and as a percentage of all adults reported it ranked eighth worst. The 59 1km squares reported was also low being the sixth worst year and below the 5ya of 72. The flight period was normal however, as was the peak in week 29 (16th – 22nd July). The transect counts were variable relative to their averages: e.g. Dunstable Downs 16 (15 5ya); Sharpenhoe Clappers 44 (62 5ya); Totternhoe Quarry 1 (6 5ya); Whipsnade Downs 18 (58 5ya) and Whipsnade Zoo 383 (284 three year average). The largest casual record of 24 was on 24th July at Totternhoe Quarry (Chris Walpole) an interesting contrast to that site's transect total.

Essex Skipper *Thymelicus lineola*

123 records were of Small/Essex Skipper when observers were unable to distinguish the species in the field, but there were 71 records of positive recognition, which was about average. It was also a rather poor season for this species with transect totals generally down, e.g. Dunstable Downs 8 (15 5ya); Sharpenhoe Clappers 15 (23 5ya); Whipsnade Downs 4 (8 5ya), but up a little at Whipsnade Zoo 75 (54 three year average). Flight period was normal, as was the peak in weeks 29-30 (16th July – 29th July). Records were thinly scattered over much of the county but with a slight tendency towards chalk grassland.

Large Skipper *Ochlodes venata*

This species also had a rather poor season. All the long-running transects returned reduced counts, e.g. Dunstable Downs 22 (33 5ya); Old Warden Tunnel 6 (15 5ya); Potton Wood 31 (51 5ya); Sharpenhoe Clappers 6 (34 5ya); Totternhoe Quarry 1 (9 5ya); Whipsnade Downs 5 (17 5ya). Only the relatively new Knocking Hoe transect showed a rise to 14 (7 three year average). Overall 2.13% of records were of this species, the third-worst year, and the 1.57% of all adults reported was the fifth worst. Distribution however remained good – the 100 1km squares reported was the sixth best year. As usual the largest counts were from woodlands, but only Chicksands Wood, College Wood, Home Wood

Northhill, Palmer's Wood and Washer's and Daintry Woods produced double-digit records, the largest being of 25 in Chicksands Wood on 4th July (Andrew Chapman) and 3rd August (Mike Hallsworth).

Dingy Skipper *Erynnis tages*

Reported from Barton Hills, Chicksands Military Base, Dunstable Downs, Houghton Regis Chalk Pit, Knocking Hoe, Lidlington, Marston Vale Millennium Country Park, Old Warden Tunnel, Pegsdon Hills, Sandy Smith NR, Sewell Cutting, Sharnbrook Summit, Sharpenhoe Clappers, Totternhoe Limeworks and Old Quarry, Whipsnade Downs and Whipsnade Zoo. It was the species' third best year on record for abundance, 1km squares and percentage of all records, despite having a delayed start to its season on 4th May and continuing to a normal end date of 23rd June. The transect data varied considerably though with the 98 recorded on Dunstable Downs twice its 5ya, but the 15 at Totternhoe Old Quarry half the 5ya. The other transects fell between these extremes.

Grizzled Skipper *Pyrgus malvae*

This species had a poor year, ranking 14th for reported adults and 17th for distribution, recorded in only 10 1km squares. Transect data confirmed the poor season with 36 counted at Dunstable Downs (5ya 59), and only nine at Whipsnade Downs (5ya 45). The recently-started transect at Whipsnade Zoo however reported 19, only one below the highest of its three prior counts. This species also had a delayed start on 4th May and all records bar three were made by 9th June. A thin tail then extended to 2nd July. It was recorded at Dunstable Downs, Marston Vale Millennium Country Park, Totternhoe Old Quarry, Whipsnade Downs and Whipsnade Zoo. It was also found to be surviving on a scrap of brownfield land near Cople.

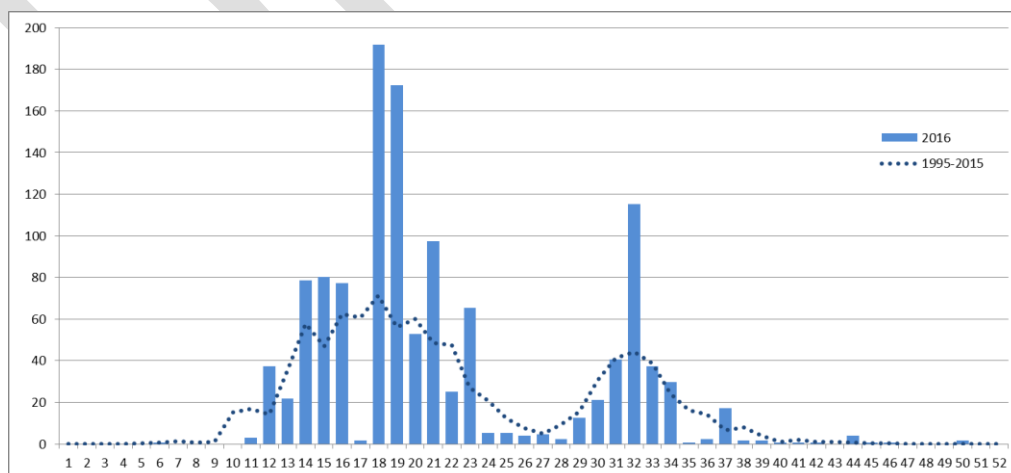
Whites

Clouded Yellow *Colias croceus*

The first record of this migrant species was from a Whipsnade garden on 7th July. There was then a gap until the 14th August which started a small burst of sightings in every week until the 15th September, the final record. Numbers were low totalling only 21 adults for the entire season and this probably included duplicate records because there were several reports each from Broom, Luton Hoo, Pegsdon Hills, Totternhoe and Whipsnade.

Brimstone *Gonepteryx rhamni*

Although the summer brood of 2015 had been recorded as low the spring emergence of overwintering adults in 2016 was larger than normal showing that the 2015 season had actually been successful. The summer emergence in 2016 was essentially normal except for a large count in week 32 (6th – 12th August). The large spring abundance led to large annual counts placing 2016 in second place for the number of records, number of adults, percentage of all adults and 1km squares, and first place with 7.0% of records. Unsurprisingly therefore transect counts were above normal, e.g. Dunstable Downs 141 (122 5ya); Potton Wood 97 (59 5ya); Sharpenhoe Clappers 171 (121 5ya) and Totternhoe Quarry 116 (53 5ya).



2016 versus 1995-2015: Brimstone adults per week per 10,000 records per year

Large White *Pieris brassicae*

Counts on the transects were generally down a little on average, e.g. Dunstable Downs 30 (57 5ya); Potton Wood 38 (106 5ya); Sharpenhoe Clappers 43 (58 5ya); Totternhoe Quarry 17 (27 5ya); Whipsnade Downs 9 (55 5ya), but in overall recording it was a fair year, ranking between fifth and seventh depending upon the chosen statistic. The abundance of the second brood seemed to drop off a

little earlier than usual following a large peak in week 29 (16th – 22nd July) which itself was a week or two earlier than usual. The 156 1km squares (the sixth best year) represented most parts of the county.

Small White *Pieris rapae*

Both broods had slightly below average abundance, but more noticeably on the second. This reflected in lower than average counts on the transects at Dunstable Downs 164 (212 5ya); Old Warden Tunnel 7 (18 5ya); Potton Wood 21 (60 5ya) and Whipsnade Downs 75 (131 5ya), however transects at two sites were above average: Sharpenhoe Clappers 299 (221 5ya) and Totternhoe Quarry 113 (81 5ya) demonstrating an uneven picture. Different overall statistics rank the year between sixth and twelfth except for the 188 1km squares, which ranked third. The species was reported from all parts of the county except for TL06 which was unrepresented.

Green-veined White *Pieris napi*

It was a similar story for this species with both broods slightly below average abundance. The peak of the second brood was a week or two later than usual in week 32 (6th – 12th August). Transects were both above and below their 5ya, e.g. Dunstable Downs 42 (33 5ya); Old Warden Tunnel 16 (25 5ya); Potton Wood 387 (364 5ya); Sharpenhoe Clappers 71 (78 5ya); Totternhoe Quarry 4 (16 5ya); Whipsnade Downs 12 (5ya 22). Like Small White, TL06 was unrepresented in the widespread distribution of 191 1km squares, ranking as its fifth best year.

Orange Tip *Anthocharis cardamines*

It was a reasonable year for this species. In overall recording the 859 adults reported were second only to 2011's 1037, and the 168 county-wide 1km squares were beaten only by the 185 of 1999. The transect counts though were generally around, or below, average, e.g. Dunstable Downs 30 (37 5ya); Old Warden Tunnel 8 (12 5ya); Potton Wood 24 (20 5ya); Sharpenhoe Clappers 15 (14 5ya); Totternhoe Quarry 3 (6 5ya); Whipsnade Downs 10 (19 5ya); The first record (a male) on the John O'Gaunt golf course on 31st March (Stephen Thompson) was premature because the next sighting wasn't until 11th April, the start of the main flight period. This lasted until 9th June, followed by a lone male on 15th. The peak was in week 19 (7th – 13th May) when exactly 250 were reported. As usual some records of the easy-to-find eggs and caterpillars were also reported, but none for the elusive chrysalids.

Hairstreaks

Green Hairstreak *Callophrys rubi*

This hairstreak was recorded from Dunstable Downs, Knocking Hoe, Lidlington, Marston Vale Millennium Country Park, Pegsdon Hills, Sandhouse Lane NR, Sewell Cutting, Sharpenhoe Clappers, Totternhoe Old Quarry, Whipsnade Downs and Whipsnade Zoo. 2nd May was the latest start to its season since 4th May 1998, the latest on record, and it continued until 21st June six days earlier than the latest flights (27th June in 1995 and 2013). Abundances on the Dunstable and Whipsnade Down transects were well below average, but were near to normal on the Sharpenhoe Clappers and Totternhoe Quarry transects. The largest count from casual recording was of 12 on Whipsnade Downs on 16th May (Judith Barnard).

Purple Hairstreak *Neozephyrus quercus*

Found by those with the determination to seek it out in Chicksands Wood, Eversholt, King's Wood Heath & Reach, Maulden Wood, Sandy Heath Quarry and The Lodge, over the period 7th July to 23rd August. The largest count of nine was at Sandy Heath Quarry on 18th August (Andrew Chapman).

White-letter Hairstreak *Satyrium w-album*

This species was rather elusive this year being recorded only in small numbers from Chicksands Wood (13th July - 7th August), Maulden wood (10th August) and Potton Wood (6th August). The largest count of six was at Chicksands Wood on 14th August (Mike Hallsworth).

Black Hairstreak *Satyrium pruni*

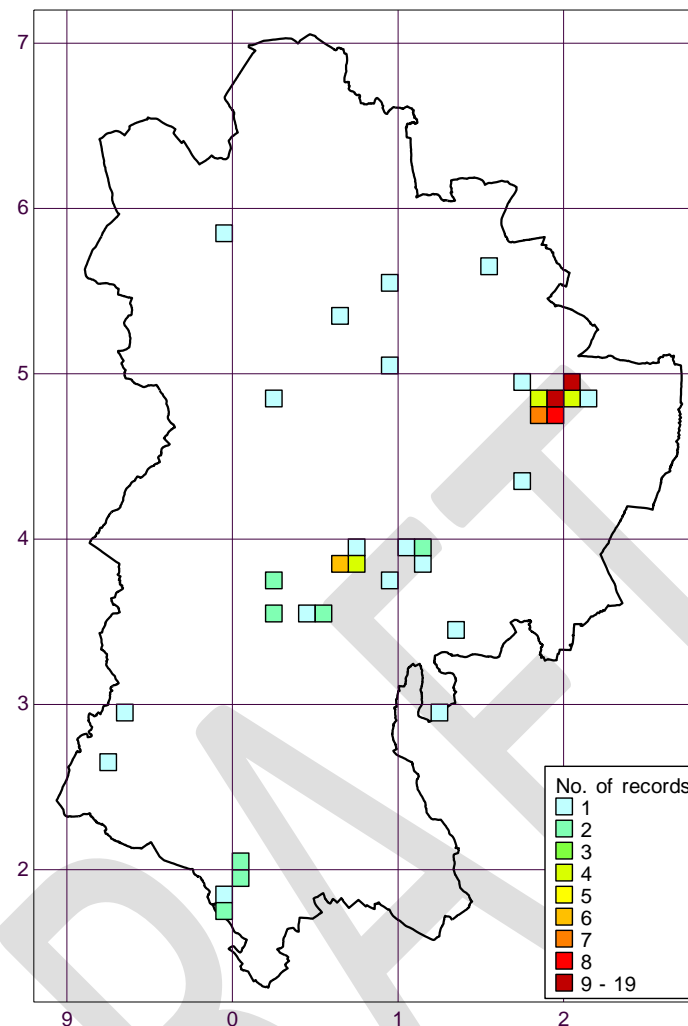
Despite several people looking there were no confirmed records of Black Hairstreak this year, but a third-party report said that one was sighted at Marston Thrift at around the end of June.

Coppers, Blues and Metalmarks

Small Copper *Lycaena phlaeas*

Although the year ranked only 15th for the number of 1km squares and percentage of records reported, and should therefore be regarded as a relatively poor season, the total of 324 adults actually surpassed the previous annual highest of 292 in 2010. This anomaly is explained by the large quantity of third brood adults flying at The Lodge throughout September where conditions on the Ridge and Summer Trails were particularly favourable, accounting for 233 of the overall total. The highest count was of 85

on 11th September (Tim Robson). Other hot-spots were across the road on Sandy Heath (23) and on Maulden Heath (27). Numbers were low elsewhere.



Distribution of Small Copper records in 2016 showing the hot-spots

Small Blue *Cupido minimus*

Our smallest butterfly was reported from Dunstable Downs, Houghton Regis Chalk Pit, Kensworth Chalk Pit, Sewell Cutting, Sharpenhoe Clappers / Moleskin, Totternhoe Quarry / Limeworks / south-east cliff and Whipsnade Downs. The Dunstable Downs transect count was a record high of 16, and so was Sharpenhoe Clappers transect count of 25. By contrast the Totternhoe Quarry transect count was low at 5 (5ya 15) and none was reported from the transects at Whipsnade Downs and Knocking Hoe, though neither site normally reports many. The main flight period was normal (12th May to 3rd July) peaking in week 22 (28th May – 3rd June). Just one second brood adult was reported, from Kensworth Quarry on 23rd August (Charles Baker).

Brown Argus *Aricia agestis*

Data from most transects and casual recording suggest that the flight period and abundance were fairly normal. Transects counts were only slightly below their 5ya except at Whipsnade Downs where the 20 recorded was well below the 78 5ya. Overall distribution was slightly reduced however, reported from 36 1km squares versus the 5ya of 43 (which coincidentally is also the average since 1995). The largest daily transect count was of 25 at Dunstable Downs on 9th June (Wilf Powell) and the largest casual count was 21 from Sandy Smith NR on 17th August (Tim Robson).

Common Blue *Polyommatus Icarus*

This species had a poor season demonstrated by all transects returning below average counts, e.g. Dunstable Downs 155 (290 5ya); Old Warden Tunnel 5 (25 5ya); Sharpenhoe Clappers 238 (325 5ya), Whipsnade Downs 37 (153 5ya). Statistics from casual recording were similarly depressed, though the species was still well distributed, recorded from 91 1km squares, which is the seventh highest total. The

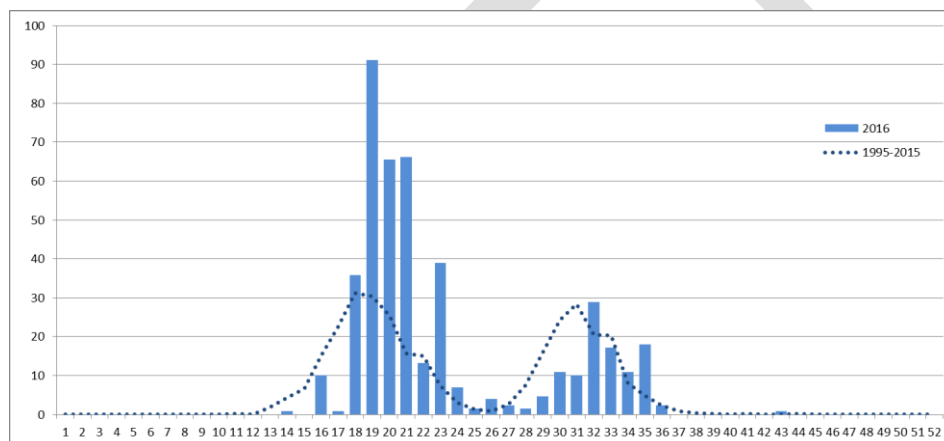
flight period was normal with first and second brood peaks in weeks 23 (4th – 10th June) and 33 (13th – 19th August) and the abundance of the second brood larger than the first. The penultimate record was on the 28th September but the final record, of a worn female, was on 18th October at Sandy Smith NR (Sue Raven).

Chalkhill Blue *Polyommatus coridon*

The transects tell a mixed story for this species. Dunstable Downs' count of 364 was above the 5ya of 250; Sharpenhoe Clappers' 2621 was almost exactly the 5ya of 2664; Totternhoe Quarry's 941 was a little down on the 1029 5ya and Whipsnade Down's 334 was well down on the 686 5ya. The first flight was on 5th July but the next wasn't until the 12th which was followed by a rapid rise in numbers peaking in week 30 (23rd – 29th July) a little earlier than usual, and the season was essentially over by week 36 (3rd – 9th September). It was reported from most chalk sites as usual. With 12.08% of all adult butterflies reported this species ranked in second place behind Meadow Brown.

Holly Blue *Celastrina argiolus*

There was no clear gap between the first and second broods but the abundance of the first was clearly greater and probably marks the zenith of the species' periodic cycle. There was an interesting photographic record of a fresh-looking specimen in Biggleswade on 28th October (Lionel Burgess), presumably of a third brood as the latest second brood records were on 7th September. The 1km square count of 123 was the second largest annual total (141 in 1998) and abundance figures suggest it ranks in the top third of years since 1995.



2016 versus 1995-2015: Holly Blue adults per week per 10,000 records per year

Duke of Burgundy *Hamearis lucina*

The Whipsnade Downs transect total was 56, a little below the 5ya of 66. The Totternhoe Quarry transect count was 17 vs the 5ya of 24. Only the Dunstable Downs transect had a raised count of seven, higher than the 5ya of 2.2 and equal to the 2014 total, its highest. The flight period started late, on 5th May and was undoubtedly affected by the declining weather as the month progressed, with no records at all between 27th May and 6th June, and just three more records, the last on 14th June. The largest daily total for a site was 27, on the Whipsnade Downs transect on 15th May (Greg Herbert).

Nymphalids

White Admiral *Limenitis camilla*

Numbers were extremely low with a total of only 13 adults reported; the second lowest to 2002's ten. Reported only from Chicksands Wood (4), College Wood (4), Washer's and Daintry Woods (1), King's Wood Heath & Reach (3) and West Wood (1) all between 6th and 28th July. The species has now had five consecutive poor years, but it has recovered from low abundances before (from 10 in 2002 to 191 in 2010) and will hopefully do so again.

Purple Emperor *Apatura iris*

The species was briefly seen at only two sites this year; Chicksands Wood (14th – 19th July) and Maulden Wood (11th – 30th July). Lone males and females were seen at both sites and at Maulden Wood a female was observed laying on sallow on the main ride on 18th July (Patricia Clegg, Sue Raven, Tim Spencer).

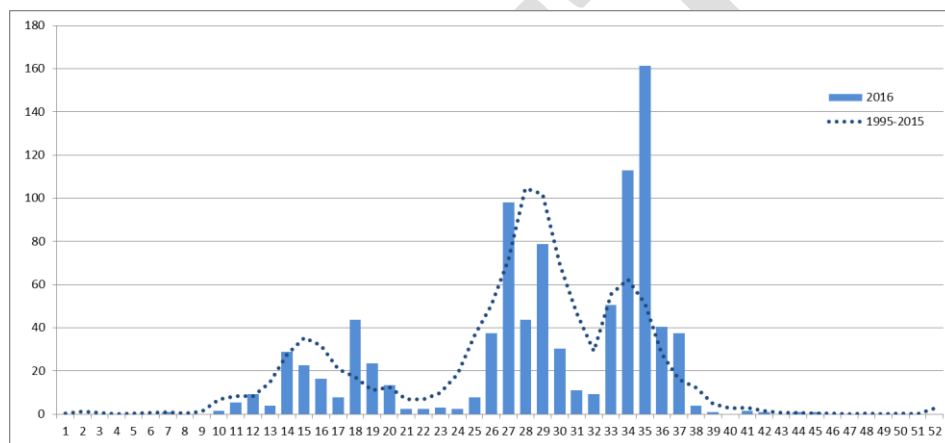
Red Admiral *Vanessa atalanta*

The yearly total of 1090 adults reported ranks second, between 2011's 890 and 2006's 2380. The 172 1km squares county-wide distribution was also a second place. The numbers on most transects were well above their 5ya confirming that the species had a good season. It was the first species on the wing, on 23rd January, and only Brimstone flew later than its final sighting on 11th November. Only nine had been reported until the start of May, when a small increase was noted lasting until week 29 (16th - 22nd July) when numbers rose markedly with 79 that week. Numbers remained at about this level until week 33 (13th – 19th August) when they dropped sharply for three weeks, rising again to the previous levels throughout September. Reports then dropped to an average of about one per day until the end of the season. On 15th September a westerly passage was noted on Sandy Heath, with 25 counted over about 45 minutes (Steve Blain). 131 adults captive-bred from local wild stock were released in Leighton Buzzard over the period 4th – 28th September, adding to its local abundance (Martin Flood-Powell).

Painted Lady *Vanessa cardui*

Reports of this migrant species started on 24th May and rose steadily until mid-August. A decline then set in ending with the penultimate record on 5th October and the last on 23rd October. There were two "flurries" within this period; week 23 (4th-10th June) when 22 were reported; and week 31 (30th July– 5th August) with 21. The season's total was only 149. Records were well distributed showing no particular locational preference.

Small Tortoiseshell *Aglais urticae*

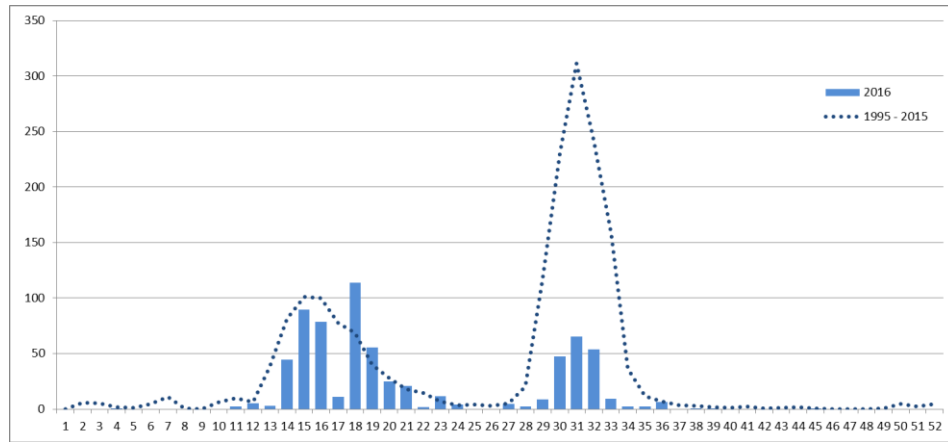


2016 versus 1995-2015: Small Tortoiseshell adults per week per 10,000 records per year

It can be seen from the above chart that the post-hibernation abundance was fairly normal though the cool April weather distorted the peak to be in week 18 (30th April – 6th May). First brood abundance was slightly subdued, but the second brood was much more successful with peak abundance during the last couple of weeks of August larger than usual, and abnormally larger than the first brood. There were several records of double-digit abundance during this period; the largest was of 15 feeding together on a buddleia in Biggleswade on 29th August (Steve Blain). The year ranked about sixth for the percentage of records and number of adults reported and third for the number of 1km squares with 197, behind 1995's 200, and 2014's 234. Records came from most parts of the county.

Peacock *Inachis io*

The abundance of the post-hibernation emergence was reasonably typical. It started on 13th March and continued until 16th June, peaking in early May a few weeks later than normal once the cool weather was over. The new brood emergence began on 5th July and peaked as normal in week 31 (30th July – 5th August) and was essentially over by week 38 (3rd – 9th September) with most hibernating by then. The abundance of the new brood however was low at about 20% of normal indicating a poor breeding season. Being slightly later to pupate than Small Tortoiseshell the heavy rains during June may have taken more of a toll on the immature stages of this species. The year ranked third worst looking back to 1995 for the number of adults and percentage of records reported.



2016 versus 1995-2015: Peacock adults per week per 10,000 records per year

Comma *Polytonia c-album*

With its post-hibernation emergence in late March, peaking in week 14 (2nd – 8th April), first brood peaking in week 29 (16th – 22nd July) and smaller second brood peaking in week 37 (10th – 16th September), it was a rather typical season for this species. Transect abundances at Dunstable Downs, Old Warden Tunnel, Potton Wood and Totternhoe Quarry were all very close to their 5ya, only Sharpenhoe Clappers and Whipsnade Downs were below par. Statistics from casual recording suggest an average year overall. The highest count of 12 was reported from Stanford Wood on 25th July (Roger Murphy) and observations, as usual, were made in most parts of the county.

Fritillaries

Dark Green Fritillary *Argynnis aglaja*

This species was reported in low numbers, the largest casual count being of only four, from Barton Hills, Dunstable Downs, Knocking Hoe, Pegsdon Hills, Rokum Hole, Sharpenhoe Clappers / Moleskin, Whipsnade Downs and Whipsnade Zoo. The total of 55 on the Sharpenhoe Clappers transect was the lowest since 2000 (24) although the count of 21 on the newly established Whipsnade Zoo transect was its largest. The season started on 22nd June and was essentially over by 6th August, though there were three more records to the 23rd. The peak date on the Sharpenhoe Clappers transect was 12th July when 20 were recorded (David Chandler).

Silver-washed Fritillary *Argynnis paphia*

This fritillary had a good season with 257 adults reported, second only to 2014's 265; though the 1km square distribution of 24 was quite a bit lower than that year's 33. Records were received for Biggleswade, Center Parcs, Chicksands Wood, College Wood, Hanger Wood, Home Wood Northill, King's Wood Heath & Reach, King's Wood Houghton Conquest, Marston Thrift, Maulden Wood, Pegsdon Hills, Potton Wood, Putnoe Wood, Salem Thrift, Studham, Washer's and Daintry Woods, West Wood. The 27 recorded on the Potton Wood transect was slightly above the 5ya of 25. The flight period was normal, from 2nd July to 30th August.

Browns

Speckled Wood *Pararge aegeria*

The transect at Potton Wood returned a count of 358, larger than the 5ya of 279. The transects at Totternhoe Quarry and Whipsnade Downs were also up slightly on their 5ya, but the transects at Dunstable Downs, Old Warden Tunnel and Sharpenhoe Clappers were slightly down. The overall 1km square count of 151 was exactly the same as the 5ya and the 4.03% of all adults reported was slightly up on the 5ya of 3.49%. The weekly data suggest that the first and second broods may have been slightly subdued but the third brood did rather better.

[Wall Brown *Lasiommata megera*

No Wall Browns were reported in 2016. The last reports were in 2012 and the species is feared extinct in the county.]

Marbled White *Melanargia galathea*

This species had quite a good year with most statistics showing it to have been above average. Counts on the transects at Dunstable Downs, Knocking Hoe and Pegsdon Hills were their highest ever but at Sharpenhoe Clappers it was close to the 5ya. At Old Warden Tunnel, Totternhoe Quarry and Whipsnade Downs however low counts were returned. The 1km square count of 103 was second only

to 2014's 106 and records came from grasslands in most parts of the county, but as usual there were none from TL15 (north-east of Bedford). 9.07% of all adults reported were of this species, putting it in fourth place. The largest count of 150 was from Sharpenhoe Clappers (Peter Glenister), but Bromham Lake LNR had 110 (Peter Almond), and the managed grassland near Galsey Wood at Thurleigh airfield had 100 (Laura Downton).

Gatekeeper *Pyronia tithonus*

This species' run of poor seasons continued in 2016 with the percentage of records and adults the fourth lowest, and the number of adults the third lowest, looking back to 1995. Counts on transects were the lowest ever at Knocking Hoe, Mowsbury Hill, Old Warden Tunnel and Pegsdon Hills; the worst since 1998 at Totternhoe Quarry; the worst at Whipsnade Downs since 2010 and the worst at Dunstable Downs since 2011. The number of well-spread 1km squares however ranked ninth showing that it is still widespread and it was the sixth most-reported species, so is still quite abundant. The flight period was normal, peaking in week 30 (23rd – 29th July).

Meadow Brown *Maniola jurtina*

Although it retained the number one spot as the most-reported species Meadow Brown didn't have a good season and its 14.31% of all adult butterflies reported was its fifth worst year. Most transects reported low abundance, e.g. Dunstable Downs 315 (763 5ya); Potton Wood 184 (327 5ya), Sharpenhoe Clappers 866 (1357 5ya); Totternhoe Quarry 136 (300 5ya); Whipsnade Downs 244 (576 5ya). Knocking Hoe and Pegsdon Hills transects fared a little better and the latter's count of 379 was just the highest (vs 370) in its short three year history. Distribution held up though, the 203 1km squares was its fourth best year. The flight period was normal as was the peak in week 29 (16th – 22nd July).

Ringlet *Aphantopus hyperantus*

The species had a fairly average year according to most transect counts, being around the 5ya at Dunstable Downs 354 (385 5ya), Old Warden Tunnel 129 (112 5ya) and Potton Wood 505 (511 5ya). Counts were down a little though on Sharpenhoe Clappers 194 (278 5ya) and Totternhoe Quarry 107 (166 5ya) and well down on Whipsnade Downs 59 (301 5ya). Overall more records were submitted for 2016 than any previous year, and the percentage of all records and 1km square distribution were its second best year. With 11.5% of all butterflies reported, this species ranked in third place. Flight period was normal though its first couple of weeks were slightly subdued. Its peak was in week 27 (2nd – 8th July) was normal.

Small Heath *Coenonympha pamphilus*

It was a bit of a non-descript season for this species. Overall statistics rank it somewhere around eighth to tenth of years since 1995 for abundance, records and 1km squares. The first brood, which flew from early May to early August, was reported in slightly lower abundance than usual, but the second brood which flew from mid-August to late September was about normal. On the transects totals were generally down on average: Dunstable Downs 144 (199 5ya); Knocking Hoe 108 (170 three year average); Old Warden Tunnel 0 (6 5ya); Sharpenhoe Clappers 46 (119 5ya); Totternhoe Quarry 19 (5 5ya); Whipsnade Downs 39 (108 5ya); Whipsnade Zoo 693 (843 three year average). The largest single record was of 20 on section 2 of the Whipsnade Zoo transect on 8th September (Shea Marshall).

Acknowledgements

We are very grateful for the efforts of the 262 people listed here who reported their sightings directly, online or via newsgroups. We apologise if any name has been inadvertently omitted.

P.Almond, D.Anderson, M.Attenborough, B.Aucott, L.Bacon, M.Bailey, C.R.B.Baker, P.M.Baker, K.Balmer, K.Banham, A.Banthorpe, M.Banthorpe, J.Barnard, D.Barnes, G.Barnes, M.Barnes, K.Barnett, R.Bashford, G.Bellamy, P.Bellamy, J.Bentham, M.Bird, J.Bishop, W.Bishop, S.Blain, C.Boon, R.Brind, S.Brooke, M.Brown, L.Bruce, A.Bucknall, C.Bucknall, G.Bunce, L.Burgess, P.Burgoine, J.Burkett, P.Busby, S.Cain, C.Campbell, L.Carman, Christopher Carpenter, Colin Carpenter, G.Carpenter, R.A.Cartwright, G.Castle, D.Chandler, P.Chaney, A.Chapman, J.Chapman, A.Chick, A.Childs, P.Childs, A.Clark, R.Clark, S.Clark, G.Clarke, P.Clegg, E.Clements, J.Comont, G.Conridge, P.Cottier, L.Coulson, P.Cox-Smith, T.Craddock, P.Crann, J.Curd, A.Cutts, Y.Cutts, C.Davies, B.Davis, G.Dawes, I.Dawson, M.Dawson, J.Day, A.de Winter, M.de Winter, G.Delayahu, L.Delayahu, M.Delayahu, D.Diemann, N.Dilley, A.Donnelly, A.Doody, L.Downton, E.Dunn, R.Dunn, R.Earwaker, K.Easton, A.Edwards, J.England, D.Fisher, M.Fitzpatrick, M.Flood-Powell, D.Ford, P.Ford, M.Fowlie, S.Furlong, H.Gebler, W.George, E.Gilbertsdottir, C.Gilby, D.Glenister, P.Glenister, R.Glenister, A.Green, D.Green, J.Green, M.Green, R.Gregory, H.Griffiths, A.Grimsey, M.Gurney, R.Hall, M.Hallsworth, S.Halton, M.Hammond, P.Harlow, A.Harris, M.Harvey, A.Henry, B.Henry, G.Herbert, M.Herbert, J.Hicks, R.Hicks, M.Higgs, A.Hipkiss, G.Hitchcock, G.Hogg, N.Hollis, P.Hollis, B.Hook, M.Hooper, S.Horsnall, P.Howard, D.Howe, P.Humphrey, D.Inward, V.Inzani, K.Isaac, D.James, P.Jarman, D.Kay, F.Kay, I.Kimsey, L.King, J.Knight, S.Knight, R.Knock, C.Le Boutillier, L.Lonsdale,

S.Lonsdale, J.Lynch, D.Manning, P.Marshall, S.Marshall, T.Meehan, S.Meredith, E.Miller, M.Mills, E.Milne, L.Milne, T.Moon, M.Morey, D.Morrisey, R.Morrisey, A.Moss, H.Muir-Howie, J.Murphy, R.Murphy, B.Nau, A.Neale, S.Newman, C.Norman, D.Oakley-Martin, B.O'Connor, D.Odell, P.Ostler, J.O'Sullivan, A.R.Outen, B.Parsonage, B.Pedder, M.Pellicci, D.Pennington, N.Phalasuk, K.Phillips, N.Phillips, L.Pitter, J.Pitts, Jon Powell, Julia Powell, W.Powell, K.Quantrell, D.Radford, K.Randhawa, S.Raven, N.Reed, M.Reid, R.Revels, S.Rickatson, J.Robertson, K.Robinson, P.Robinson, T.Robson, L.Rowley, M.Runchman, S.Russell, J.Sawyer, D.Seabrook, R.Seabrook, H.Seaby, J.Sears, D.Sedgley, M.Self, J.T.R.Sharrock, M.Sheridan, M.Shersby, C.Shortall, J.Showers, J.Silvey, B.Sims, I.Small, A.Smith, C.Smith, D.Smith, E.Smith, M.Smith, S.Smith, J.Sonsino, T.Spencer, B.Squires, T.Starnes, K.Thomas, T.J.Thomas, C.Thompson, S.Thompson, R.Thorp, E.Turner, T.Tween, J.Ullyett, R.Walkington, M.Wallace, C.Walpole, M.Ward, G.Warne, S.Warrington, C.Wedge, S.West, A.Whitney, M.Wilkinson, A.Williams, B.Williams, N.D.Willits, R.Wilson, K.Winder, D.Withers, I.Woiwod, I.Woiwod, A.Wood, H.Wood, T.Wood, P.Wright, Colworth Natural History Society, Moorcitizens, Wildlife Trust Volunteers

Keith Balmer and Peter Glenister are the Society's honorary joint butterfly recorders, a position they have held since 2003.

DRAFT

Flight periods and peak abundances in 2016

Species	Earliest Date	Latest Date	Peak Date	Peak Abundance
Small Skipper	19/06/2016	26/08/2016	21/07/2016	30
Essex Skipper	04/07/2016	24/08/2016	21/07/2016	13
Large Skipper	06/06/2016	17/08/2016	14/07/2016	25
Dingy Skipper	04/05/2016	23/06/2016	16/05/2016	53
Grizzled Skipper	04/05/2016	02/07/2016	14/05/2016	8
Clouded Yellow	07/07/2016	15/09/2016	08/09/2016	2
Brimstone	10/02/2016	14/12/2016	15/08/2016	20
Large White	01/04/2016	04/10/2016	18/07/2016	55
Small White	29/03/2016	03/10/2016	22/07/2016	54
Green-veined White	31/03/2016	11/10/2016	06/08/2016	28
Orange Tip	31/03/2016	15/06/2016	22/05/2016	18
Green Hairstreak	02/05/2016	21/06/2016	16/05/2016	12
Purple Hairstreak	07/07/2016	23/08/2016	18/07/2016	9
White-letter Hairstreak	13/07/2016	10/08/2016	14/07/2016	6
Black Hairstreak	2016	2016	2016	1
Small Copper	23/04/2016	03/11/2016	11/09/2016	85
Small Blue	12/05/2016	23/08/2016	28/05/2016	68
Brown Argus	09/05/2016	25/09/2016	17/08/2016	21
Common Blue	06/05/2016	18/10/2016	17/08/2016	60
Chalkhill Blue	05/07/2016	14/09/2016	26/07/2016	640
Holly Blue	05/04/2016	28/10/2016	09/05/2016	16
Duke of Burgundy	05/05/2016	14/06/2016	17/05/2016	20
White Admiral	06/07/2016	28/07/2016	06/07/2016	2
Purple Emperor	11/07/2016	30/07/2016	18/07/2016	2
Red Admiral	23/01/2016	11/11/2016	15/09/2016	25
Painted Lady	24/05/2016	23/10/2016	24/06/2016	3
Small Tortoiseshell	15/02/2016	09/11/2016	05/07/2016	22
Peacock	28/01/2016	11/11/2016	06/08/2016	10
Comma	20/03/2016	15/10/2016	25/07/2016	12
Dark Green Fritillary	22/06/2016	23/08/2016	12/07/2016	8
Silver-washed Fritillary	02/07/2016	30/08/2016	19/07/2016	9
Speckled Wood	31/03/2016	21/10/2016	17/07/2016	50
Marbled White	19/06/2016	25/08/2016	07/2016	150
Gatekeeper	02/07/2016	08/09/2016	28/07/2016	42
Meadow Brown	09/06/2016	27/09/2016	14/07/2016	100
Ringlet	19/06/2016	31/08/2016	14/07/2016	200
Small Heath	04/05/2016	25/09/2016	08/09/2016	20

Summary of 2016's records of adults at 10th February 2017

Species	Records	Adults	Squares		Records (%)	Adults/All-species adults ¹ (%)				
			10km	1km		2012	2013	2014	2015	2016
Small Skipper	190	718	15	59	1.48	1.48	1.00	1.39	1.78	1.56
Essex Skipper	71	132	12	24	0.55	0.22	0.17	0.28	0.30	0.29
Small/Essex Skipper	123	438	12	40	0.96	0.39	0.63	1.07	1.09	0.95
Large Skipper	273	726	19	100	2.13	1.81	1.13	1.86	1.40	1.57
Dingy Skipper	191	629	11	28	1.49	1.11	0.66	1.15	1.54	1.36
Grizzled Skipper	55	107	5	10	0.43	0.64	0.21	0.32	0.28	0.23
Clouded Yellow	17	21	9	12	0.13	0.00	0.09	0.08	0.05	0.05
Brimstone	898	1563	19	192	7.00	1.69	1.83	2.85	2.50	3.39
Large White	637	1699	21	156	4.96	1.80	6.09	1.58	4.11	3.68
Small White	900	2400	19	188	7.01	3.24	6.93	2.08	4.01	5.20
Green-veined White	665	1422	20	191	5.18	2.73	2.42	2.12	2.31	3.08
Small/G.V. White	91	516	11	49	0.71	0.71	1.40	0.30	0.54	1.12
Orange Tip	441	859	21	168	3.44	1.85	0.85	1.21	0.97	1.86
Green Hairstreak	67	121	9	17	0.52	0.29	0.31	1.14	0.45	0.26
Purple Hairstreak	11	38	5	8	0.09	0.06	0.04	0.13	0.10	0.08
White-letter Hairstreak	9	18	3	4	0.07	0.05	0.08	0.07	0.12	0.04
Black Hairstreak	1	1	1	1	0.01	0.00	0.00	0.01	0.01	0.01
Small Copper	94	324	13	34	0.73	0.31	0.27	0.23	0.33	0.70
Small Blue	88	329	4	13	0.69	0.81	0.42	1.11	0.61	0.71
Brown Argus	221	516	13	36	1.72	0.60	0.64	1.17	1.24	1.12
Common Blue	501	1528	19	91	3.90	1.56	4.14	5.11	4.51	3.31
Chalkhill Blue	294	5570	7	23	2.29	14.28	20.75	11.55	19.22	12.08
Holly Blue	385	568	19	123	3.00	0.46	0.24	0.14	0.59	1.23
Duke of Burgundy	63	213	4	6	0.49	0.63	0.20	0.55	0.39	0.46
White Admiral	12	13	5	7	0.09	0.05	0.03	0.06	0.06	0.03
Purple Emperor	13	14	2	3	0.10	0.06	0.02	0.05	0.03	0.03
Red Admiral	581	1090	20	172	4.53	2.55	0.38	1.24	0.73	2.36
Painted Lady	131	149	17	81	1.02	0.06	0.09	0.12	0.33	0.32
Small Tortoiseshell	640	1176	19	197	4.99	0.93	2.46	4.05	2.49	2.55
Peacock	535	866	20	159	4.17	2.08	4.23	5.26	3.60	1.88
Comma	352	552	18	116	2.74	1.77	1.23	1.14	1.38	1.20
Dark Green Fritillary	97	183	6	16	0.76	0.58	0.77	0.46	0.57	0.40
Silver-washed Fritillary	107	257	12	24	0.83	0.18	0.22	0.42	0.24	0.56
Speckled Wood	727	1860	19	151	5.67	3.29	2.38	3.63	2.57	4.03
Wall Brown	0	0	0	0	0.00	0.01	0.00	0.00	0.00	0.00
Marbled White	462	4183	18	103	3.60	8.19	5.14	8.18	7.57	9.07
Gatekeeper	564	2069	18	139	4.40	4.30	3.89	5.44	5.75	4.49
Meadow Brown	1203	6601	21	203	9.38	23.18	17.81	16.56	14.69	14.31
Ringlet	676	5304	21	164	5.27	13.85	7.82	12.45	9.01	11.50
Small Heath	425	1343	15	57	3.31	2.19	3.03	3.44	2.55	2.91
Overall	12832	46116	21	435						

¹ These values show the number of adults reported for each species relative to the number of adults reported for all species, allowing crude year-on-year comparisons to be made using data partially acquired by casual recording.